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VIDEO SIGNAL RECORDING DEVICE PREVENTING COPYING
[複製防止する映像信号記録装置]

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(54) Title of the Invention **VIDEO SIGNAL RECORDING DEVICE
PREVENTING COPYING**

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(54) [Title of the Invention] **VIDEO SIGNAL RECORDING DEVICE**

PREVENTING COPYING

(57) [Abstract]

[Goal] To have a video signal recording device prevent copying of video signals that are protected by copyright, and record within a valid video region the user ID of the person copying during recording, and display when reproducing, to prevent a flood of copies.

[Constitution] By detecting copyright information by a video decoder 4, and if the copyright flag is set, a microcontroller 9 detects an ID number by a user IDROM 8 through OSD 10, and superimposes the user ID number in a valid video region, records, and reproduces.

[Claims]

[Claim 1] A video signal recording device which prevents copying wherein there is detection of copyright information which shows the necessity of copyright preservation which was pre-inserted in the input video signal which must be recorded, and when the above-mentioned copyright preservation information is detected, there is superimposition of characteristic display information which was prefixed in every recording device in a valid video region which is displayed on the screen for the above-mentioned input video signal, and then recorded.

[Detailed Description of the Invention]

[0001]

[Industrial Field of the Invention] This invention is related to a video signal recording device which prevents a flood of copy products of video signals.

[0002]

[Prior Art] Recently, in order to preserve copyrights, there have been various proposals to prevent the copying of video signals. Below, there is an explanation of conventional copy prevention means.

[0003] The macro vision method for VTR recording reproduction superimposes a special signal on one part of the video signal, and when there is recording by a separate recording device of this signal, normal recording is not possible. That is, as in Patent H2-500709, there is constructed a video signal by superimposing a level pulse signals of many levels of a video signal within a vertical blanking period of the video signal as in Figure 4, and when there is recording by inputting the signal into a video signal recording device, an AGC circuit of a video recording circuit as in Figure 5 operates, and recording in a form wherein the amplitude of the video signal is extremely small, and the reproduced image cannot be approved, so consequently, duplication is prevented.

[0004] In addition, the means that is disclosed in Patent H6-339110 superimposes, as shown in Figure 6, copyright information in a space outside of the valid image space which is displayed on the screen of the image information, and thus there is a transmission method which prevents duplication by sending the image information. Furthermore, in Patent H2-35661, there is detection of a copy guard signal which is included within the image transcription signal, and there is display of software for the execution of the copyguard and useless dubbing is prevented.

[0005]

[Problems that the Invention is to Solve] However, without processing the signal of a valid video region which is displayed on the screen of a video signal whose copyright is preserved in the conventional copy protection means, in order to record on a recording medium, there is the possibility of copying by acquiring according to a means for which this video signal is not affected by the copy prevention signal.

[0006] This invention solves the above-mentioned prior art problems and it is not possible to restore or acquire the original video signal from signals which are recorded on the recording medium, and thus the goal of providing a video signal recording device which records on a recording

medium by processing a valid signal region which is displayed on a display of the video signal is satisfied

[0007]

[Means for Solving the Problems] In order to achieve this goal, this invention's video signal recording device has a means for detecting copyright preservation information from the inputted video signal, and has a structure which records by superimposing the characteristic display information in the video device when detecting preservation information.

[0008]

[Use] According to this structure, when recording video signals whose copyright is preserved, there is superimposition of the characteristic display information which displays the video signal and duplicate, and because there is recording in a valid video region, at the time of reproduction of the video signal which has been copied illegally, and because information about the recording device's characteristics is shown on the reproduction screen, it is possible to prevent a flood of copies of the recording video signal.

[0009]

[Working Example] Below, there is an explanation, by referencing the drawings, of one working example of this invention.

[0010] In Figure 1, 1 denotes input terminal, 2 denotes a demultiplexer, 3, system decoder, 4, video decoder, 5, audio decoder, 6, SR flip-flop, 7, NTSC encoder, 8, user IDROM, 9, microcontroller, 10, on screen display circuit (below, called OSD), 11 recording system control circuit, 12, recording signal modulator, 13, recording head, and 14 videotape.

[0011] the recording device which is constructed as described above, there's an explanation of its operation. Now, when there is recession of a digital transmission, the audio data, the video data, and the system data are compressed, and the multiplexed MPEG2 transport stream is assumed to input into input terminal 1. The MPEG2 transport stream as a bit data structure which is specified for digital transmissions and this MPEG2 transport stream is input into the demultiplexer 2. The demultiplexer 2, from the transport stream that was input, distributes to every decoder by acquiring the necessary transports packets in order to decode the programs for the decode targets.

[0012] The system data which is the output of the demultiplexer and inputs the data to the system decoder 3.

The system decoder 3 processes the necessary system information in order to the code the programs for the system data which was input. In addition, the video data which is the output of the demultiplexer 2 is input to the video decoder 4. The video decoder 4 outputs a digital RGB video signal by decoding the video data. The NTSC encoder 7 all puts none by forming a composite video signal from this digital RGB video signal.

[0013] In addition, the audio data which is the output of the demultiplexer 2 is input to the audio decoder 5. The audio decoder five outputs a voice signal by decoding the inputted audio data. This audio signal is input to the recording signal modulator.

[0014] Furthermore, the video decoder 4 performs detection of the copyright flag which is included in the input video data. This copyright flag is a flag all of one best which exists in the header portion within a PES packet which is used for multiplexing the video data towards a MPEG 2 transport stream and within the data structure which is callable (Figure 2 reference), and when this copyright flag is 1, a video signal displays preservation by copyright, and when 0, there is shown that any copyright preservation has not been defined in any way.

[0015] Two signal lines which are related to copyright preservation from the video decoder 4 are connected to the SR flip-flop 6. For these two signal lines, the time band (that is, the copy flag is 0) for which the data that was processed by the video decoder 4 which was not copyright preserved enters a LOW state. On the other hand, the time band for which the data that was processed by the decoder 4 has a copyright preservation, that is the copyright flag is 1, and the signal line which is connected to the S terminal of the SR flip-flop 6 enters a HIGH state, and the signal line which is connected to the R terminal of the SR flip-flop 6 enters a LOW state. In addition, if the copyright flag is 0, the signal line which is connected to the S terminal of the SR flip-flop becomes LOW, and the signal line which is connected to the R terminal of the SR flip-flop becomes HIGH. Thus, the output Q of this SR flip-flop 6 preserves the HIGH or LOW condition until the value of the copyright flag is changed. This output Q is inputted to the microcontroller 9.

[0016] The user ID which is recorded for toll transmission and reception is recorded in the user IDROM 8. When the output of the SR flip-flop is HIGH, the microcontroller reads the user ID number from the user IDROM 8, and sends to the OSD circuit 10 information which displays on the top

part of the screen a character code corresponding to the character string "COPIED BY ID: ABC012." The user ID number has six positions for this character string and displays when the code is "ABC012."

[0017] In addition, when the output Q of the SR flip-flop 6 is changed to a LOW state from a HIGH state, the microcontroller 9 sends to OSD circuit 10 the character code that corresponds to blank space, along with information for displaying the number of positions of the above-mentioned character string, that is, displaying on the top part of the screen only 19 positions. This handles cancellation of the copyright preservation. This OSD 10 takes the same time as the composite video for entering, and the character bit pattern which exists within OSD 10 reads from (not illustrated) the recorded ROM the bit pattern corresponding to the character code which is recorded in the RAM (not illustrated) within the OSD 10 by inputting from the micro controller 9, and outputs by superimposing on the inputted composite video signal.

[0018] The composite video signal which is output from OSD 10 is input to the recording signal modulator 12. When the mode which is shown according to the recording system control circuit 11 is recording mode, the composite video signal and audio signal which were input to the recording

signal modulator circuit 12 are recorded on the videotape 14 by means of the recording head 13.

[0019] Referring to the above-mentioned circuits, the programs that were decoded are maintained according to copyright, and when this video signal is recorded on the videotape 14 by the recording device, the user ID number, which is recorded in the device for which copying was performed with characters which show the copy product, is superimposed and recorded. Consequently, when this is reproduced by the reproduction device, the user ID number which exists in the device for which copying was performed is displayed on the screen and it is clearly indicated that the video that was copy protected has been copied. Figure 3 shows an example of the screen display when the video signal that was copy protected has been recorded and reproduced.

[0020] With this video signal recording device which prevents copying according to this working example as explained above, when there is recording a video signal that is copy protected, there is copying onto videotape when by positioning one part of a valid video region which is displayed on the screen of this video signal by information which displays copying ("COPIED BY ID: ABC012"). Consequently, from this videotape it is impossible to take

the original video signal which had no information to display the copying and in addition when there is reproduction by the reproduction device, the user ID number which exists in the device which performs the subject becomes the video screen of him and in order that the subject which is the copy on the screen, and the user ID number which exists in the device which performed the copying are displayed, and that the original video becomes a non-equivalent video screen. In addition, the recorder of the device which is performing the copying has to have special abilities. It is for this reason that such an operation was not done in the past, and along with the concept of copyright or direct viewing for copying, it is possible to prevent a flood of copying of video signals that are protected by copyright.

[0021] Moreover, in the above-mentioned device, whether or not the program of the decoder target is protected by copyright, the microcontroller 9 performs by testing the copyright flag which is included in the video data, and the same micro controller 9 may perform discrimination of the PES scrambling control pattern within the PES packet. In this instance, the condition that the PES scrambling control pattern is 00 corresponds to the copyright flag being 0, and when the PES scrambling control pattern is 01

or 11 or 10, these patterns correspond to copyright flag being 1, and other operations are the same as those for the above-mentioned working example.

[0022]

[Effect of the Invention] In the video-signal recording device which prevents the duplicate by this invention as mentioned above, when recording the video signal from which copyright was protected, it will replace for the information which shows that it is a duplicate in a part of valid signal field displayed on the screen of this video signal, and will record on a record medium. Therefore, when an original video signal cannot be taken out and this signal is reproduced with a regenerative apparatus, since it is a replica, and the user ID number which exists in the device which performed reproduction is displayed on a screen, it becomes an original image and a non-equivalent image screen from this record medium. While presentation to the direct viewer of the concept of copyright which is not in the above-mentioned conventional example, or a duplicate action is performed for these reasons, effective copying is made unattractive, and the flood of copies of a video signal which has copyright protection can be prevented.

[Brief Description of the Drawings]

[Drawing 1] A block diagram of a video signal recording device which prevents copying for a working example of this invention

[Drawing 2] A diagram which shows the position on the video signal of a copyright flag which shows the copyright protected video number

[Drawing 3] A diagram which shows an example of a screen display of a video signal for which was copied in the same working example and which is copyright protected

[Drawing 4] A waveform diagram of processing a video signal in order to explain the conventional means of copy prevention

[Drawing 5] A waveform diagram of a recording video signal for explaining the conventional means of copy protection

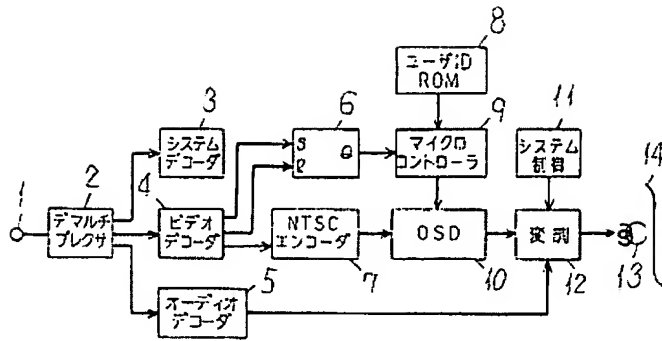
[Drawing 6] A waveform diagram of a recording video signal for explaining the conventional means of copy protection

[Simple Explanation of the Symbols]

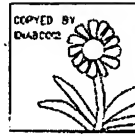
1 Input Terminal

- 2 Demultiplexer
- 3 System Decoder
- 4 Video Decoder
- 5 Audio Decoder
- 6 SR Flip-flop
- 7 NTSC Encoder
- 8 User ID ROM
- 9 Microcontroller
- 10 Onscreen Display Circuit (OSD)
- 11 Record System Control Circuit
- 12 Record Signal Modulation Circuit
- 13 Recording Head
- 14 Video Tape

【図1】

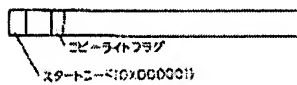


【図3】

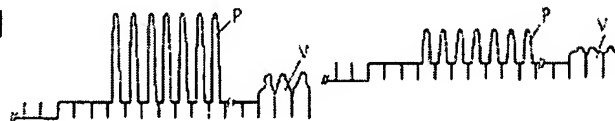


[Translator's note: all notations on drawing listed in the
"Brief Description of the Drawings" section]

【図2】



【図4】



【図5】

[Figure 2]

Copyright flag

Start code

【図6】

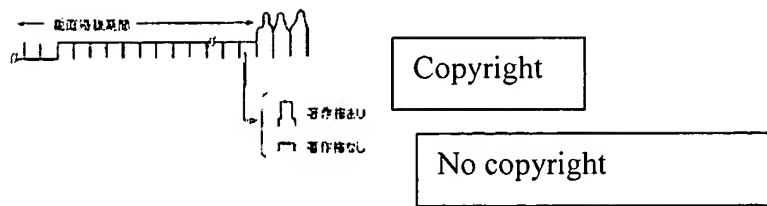


Figure 6

[Translator's note: top annotation is illegible]